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PATENT TRADEMARK OFFICE

**RESPONSE UNDER 37 CFR 1.116
EXPEDITED PROCEDURE**

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GROUP ART UNIT 1764

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN THE APPLICATION OF

STACHEW ET AL.

SERIAL NO.: 09/659,132

FILED: SEPTEMBER 11, 2000

TITLE: MODIFIED POLYISOBUTYLENE SUCCINIMIDE DISPERSANTS HAVING
IMPROVED SEAL, SLUDGE, AND DEPOSIT PERFORMANCE

DOCKET No.: 2964R

EXAMINER: J. JOHNSON

GROUP ART UNIT: 1764

Wickliffe, Ohio
Dated: July 17, 2003

Mail Stop AF
Hon. Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

Sir:

RESPONSE AND REQUEST FOR RECONSIDERATION

Response. Applicants express their appreciation for the withdrawal of the rejection under §112.

It is noted that the present rejection is designated as "final," and this finality was apparently entered because the new rejection was allegedly necessitated by Applicant's amendment of January 14, 2003. This designation of finality is respectfully traversed.

The substance of the amendment of January 14 was to introduce the subject matter of claim 29 into claim 1. The subject matter of claim 29 had never been rejected on the basis of prior art. It is not apparent how the narrowing of claim 1 by the incorporation of (clear) subject matter from a dependent claim, now "necessitates" a new rejection. Indeed, the amendment of the claim was indicated by the examiner in the Advisory Action of January 24, 2003 to have overcome the rejection that the Examiner now indicates necessary. Accordingly, it is believed that the outstanding office action should be a non-final action, and designation as such is respectfully

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on July 17, 2003

By:

Sheila E. Kelly

requested. At a minimum and as an alternative, Applicants request that the Examiner fully consider the evidence and remarks submitted herewith, even if they are deemed to be submitted after a final rejection.

In the office action of June 6, 2003, the Examiner objected to the data submitted in Dr. Abraham's declaration of October 10, 2002, in that it allegedly:

- (1) was not a comparison against the closest prior art;
- (2) does not contain an assertion that the reported results are unexpected; and
- (3) does not report in detail the results of the seal degradation test.

In response to these points, Applicants present the following:

(1). The closest reference is Diana, U.S. 5,936,041. This reference teaches the use of functionalized polymers as dispersants. The functionalization is preferably by the Koch reaction, but can be carried out by other methods such as reaction with maleic anhydride. The polymer employed preferably has a Mn of 1000 to 4000. The polymer contains less than about 10 mole % (preferably less than 5 or less than 3 mole %) of chains having a molecular weight less than 500. The product is reacted with a heavy amine to provide a dispersant.

The materials which were tested and reported in the Declaration of October 10, 2002, were the reaction product of a polymer of polyisobutylene with maleic anhydride. The polymer had a molecular weight Mn of about 2100 – 2800 and was subjected to varying degrees of stripping, to provide 7.1, 15.4, 18.6, or 24.1 mole percent of polymer with molecular weight less than 500. (The more severe stripping and removal of the low molecular weight tail tends necessarily to mathematically shift the Mn to slightly higher values.) The product was reacted with a heavy amine to provide a series of dispersants that differ in the amount of the very low molecular weight polymer component.

It is submitted that this testing constitutes a scientifically sound experimental comparison of the claimed dispersants against the closest prior art. Comparisons were not made against Diana's Koch products, for instance, because Koch products are not encompassed by the present claims. Furthermore, the comparative material as synthesized contained 7.1% low molecular weight component, which is quite close to the 10% upper limit of Diana: much closer to the limits of the present invention than is the 3% preferred by Diana; and it represents a sample of material which was in fact reasonably accessible to Applicants. Since all variables (other than, of course, the fraction of low molecular weight polymer) were held constant throughout the examples of the Declaration, it is not apparent that the materials tested differed from the closest disclosure of

Diana in any significant way or in any way that would be expected to have any effect on the comparison.

If the examiner believes that some significant variable has not been accounted for that would lead one to conclude that the comparison was not reasonably made, as judged by a reasonable scientific standard, Applicants would appreciate it if he would further clarify the supposed deficiency in a subsequent office action.

(2) Although the significant improvements in soot handling and sludge performance reported in the October 10 Declaration are believed to be sufficiently improved to speak for themselves, we submit herewith a supplemental declaration from Dr. Abraham which explains in greater detail the assertion of unexpectedness of the results. Kindly refer to the discussion beginning on page 2 of the supplemental declaration, beginning 5 lines from the bottom, where Dr. Abraham states,

In the remaining tests reported in my earlier Declaration, the results show unexpected improvement, especially in the Soot T-8 test, particularly at 0.5%, and remarkable improvement in the Sludge test #1173E.

Refer also page 5, where he states,

I find these results unexpected because I am unaware of any particular reason to believe that having a limited – but not too low – amount of very low molecular weight polymeric substituent should lead to any improvement in most of these properties. Moreover, the fact that each of these multiple properties is improved simultaneously is unusual, but very advantageous.

(3) In the same supplemental declaration, Dr. Abraham reports the detailed results of the seal testing data. As earlier stated, all of these particular samples pass the FKM assessment criteria, so there is, in this test, no particular differentiation among the samples. In particular, for those formulations or test specimens which already pass the seal tests, one would not require or expect to see any particular improvement by using the present invention.

While it is true that improved seal performance is one of the expected benefits of the present invention, it is by no means the only benefit described in the specification. Reduced sludge formation is also an important benefit discussed on page 1, and reduced soot formation is discussed at some length on page 23. Various embodiments of the present invention should exhibit at least some of these desired improvements, but of course it is not necessary that every sample exhibit every benefit in the same degree. Nor must every possible improvement be exhibited against any given reference. Thus,